



Patent Application
Serial No. 08/716,223
Attorney Docket No. 702-961170

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 1761 :
In re Application of :
G.A. VAN SCHOUWENBURG : METHOD FOR PREPARING A
Serial No. 08/716,223 : COHERENT PIECE OF MEAT
Filed November 22, 1996 : FROM SMALLER PIECES OF MEAT,
AND THE COHERENT PIECE OF
Examiner - Curtis Sherrer : MEAT OBTAINED
Pittsburgh, Pennsylvania

DECLARATION

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Gerrit Antoni Van Schouwenburg, inventor of the
subject matter claimed in the above-identified application,
having a master degree in Food Science and Technology from the
Agricultural University Wageningen, the Netherlands

declare as follows:

1. My invention requires the use of an acidifying
agent (an acid) to decrease the pH of a layer of solubilized
proteins on pieces of raw meat. I recognize that acid is used
during processing of meat for many different purposes. For
example, acid is used in marinades to tenderize meat. Acids are
also used in preparation of dry sausages, as preservatives or as
a reducing agent in a color reaction with hemoglobin. None of
those uses of acid perform the function that the acidifying agent
performs in my invention, namely, to denature and coagulate
solubilized, proteins only locally, i.e., on the interface of
smaller pieces of raw meat.

why?

2. Acid coagulation of meat in preparing a coherent piece of meat from smaller pieces of meat must occur after the pieces of meat are brought together. Otherwise, a strong acid would result in flocculation of the proteins on the surface, of the meat before the pieces are brought into intimate contact with one another. According to the process of my invention, pieces of meat are massaged or tumbled with salt to solubilize and exude proteins from the pieces of meat and activate those proteins.

Only after this initial step is accomplished and the pieces of meat are pressed together with the solubilized and exuded proteins in between should the pH at the interface be lowered by an acidifying agent to denature and coagulate those solubilized and exuded proteins, such that the pieces of raw meat are joined together.

3. The Bauer et al. Abstract relates to a method for producing sausages from meat and a "kutter" additive. The additive may include an alkali phosphate, sorbic acid and/or potassium sorbate and optionally an organic acid such as citric, tartaric, lactic or acetic acid or salts thereof. The purpose of the use of sorbic acid, potassium sorbate and the organic acids is not explained in the Bauer reference. In my opinion, clearly the Bauer reference does not suggest the use of these additives as an agent to solubilize and exude proteins from small pieces of raw meat and use these proteins for gluing the pieces of raw meat to a larger piece of raw meat. In addition, the Bauer reference does not indicate that these additives should only denature these exuded proteins when the small pieces of raw meat are pressed together. It is to be remembered that the

denaturation and coagulation of these proteins should form a protein network inbetween the small pieces of raw meat. If denaturation and coagulation occurs on each separate small piece of raw meat, the surface of proteins denature but the small pieces of raw meat are not bound together.

4. In relation to sorbic acid I take the position that its physical properties (solubility) under the process circumstances of my method, will not serve as an agent for denaturing and coagulating proteins. Accordingly, sorbic acid cannot be used to produce a piece of raw meat consisting of joint together smaller pieces of raw meat.

5. The solubility of sorbic acid is very low. At 20°C, sorbic acid has a solubility of 0.16 gram per 100 gram water. At 0°C the solubility is less then 0.08 gram per 100 water. The pH at this temperature is just 4.45. In a 40% sugar solution the solubility is at this temperature less then 0.01 gram in 100 gram water at 20°C. In a 10% salt solution the solubility is 0,07 g in 100 gram at 20°C.

6. Meat is generally processed at relatively low temperatures, such as at about 4-7°C. Salt is added during processing to solubilize and exude proteins. This salt has not yet had time to migrate into the meat, and the salt concentration at the surface of the pieces of meat will be well above 10%. The solubility of sorbic acid under those circumstances will be very low indeed. Accordingly, I expected that sorbic acid will not result in acid coagulation of pieces of meat as the solubility at the surfaces of the meat pieces will be insufficient to lower the pH sufficiently to achieve coagulation of proteins. Also an

added acid 'kutter' additive in the bowl chopper does not lead to the delayed action that is required for the acid coagulation process.

7. This expectation was confirmed in a test of acid coagulation of pieces of meat using sorbic acid at 5°C. After tumbling the meat with salt to exude the proteins, finely powdered sorbic acid was added and mixed through the meat. For testing purposes 0,5% by weight, 1.0% and 1.5% sorbic acid was added in different trials. The meat was put in a container, and under pressure, left for 24 hours at 4°C. Upon taking the meat from the containers the meat fell apart into the original pieces. No coagulation or even gelling had taken place [gelling occurs at modestly lowered pH of 4.8-5]. The sorbic acid powder was still clearly visible with the naked eye and gave a 'sandy' mouth feel to the product. The pH was well above the iso-electric point.

8. The Joy of Cooking (page 112-113) is considered as anticipating my method for manufacturing a coherent piece of raw meat from smaller pieces of raw meat. The Joy of Cooking discloses teaching of dry sausages. Lean pork and beef are cut into cubes treated with brine, rinsed with cold water, dried and cut into smaller pieces. These pieces are mixed with back fat, seasoned. Two cups (or a little) red wine or water can be worked into the dry sausage mix if it is to firm to allow successfull stuffing of the sausage mix in the sausage casing. After stuffing the sausages should hang for some time (2-4 weeks) to dry and mature.

9. In the production of this type of dry sausages

exudation of proteins is to be avoided at all costs. The brine will react with proteins on the surface of the meat pieces but a tacky layer of exuded proteins will not be formed as the use of brine and the subsequent rinsing, is meant to avoid this. If such a tacky layer is formed, this layer during drying hinders for water transport. This results in a rotting of the sausage and not in a formation of a dry sausage. In my process the massaging and/or tumbling of the small pieces of meat is required for exuding proteins onto the outer surface of the small pieces of meat.

10. The addition of (a little) water or wine is by far not enough to result in a denaturation or coagulation of proteins. Clearly water proposed as an equivalent of wine inherently does not have such denaturation function. Bearing in mind the presence of alcohol in the wine and the buffering effect of the solubilized and activated proteins, this would mean that the inherently present organic acids in wine will never result in a sufficient lowering of the pH. In addition, the large amount of wine required to lower the pH of the meat mixture significantly will render the sausage mix a watery consistency no longer suitable for stuffing or the making of a dry sausage.

11. In my process the added acidifier results in a delayed acidification. That is, this acidification and the resulting denaturation and coagulation of the exuded proteins will have to only predominantly occur when the pieces of raw meat are pressed together. Thus, locally, at the interface of the

small pieces of meat hold together, the pH is lowered resulting in denaturation and coagulation. Proteins residing within the smaller pieces of meat will not denaturate. This is a matter of dosing the correct amount of acidifying agent. This correct amount can be determined by routine experimentation.

12. Ultimately, the raw pieces of meat are glued together and obtained is a coherent piece of meat consisting of smaller pieces of raw meat glued together.

12. Accordingly, my method for the production of a coherent piece of raw meat is not and even not inherently relating to a method for producing a dry sausage.

13. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.


G.A. Van Schouwenburg

20/10/99
Date

Raalte